**CTSC/Yonkers SMART Start 2021-22**
**School Name: Pearls**
**Teacher Designer Names:**
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**Name of Project: Environmental Impact (Mudslides in Yonkers)**
**Grade: 7th Grade**

**Est. Launch Date: May**
**Duration: 5 weeks**
**Big Idea: Stability & Change**

## STAGE 1: DESIRED RESULTS

### Enduring Understandings:

- Social, economic, and environmental decisions of the past affect and shape the present.
- Environmental issues may be controversial, seen through a diverse set of lenses, and may provoke a variety of responses.
- A fact is an indisputable observation of a natural or social phenomenon. We can see it directly and show it to others.
- A hypothesis is an idea that we can test with further observations. We gather evidence to see if our hypothesis is supported.

### Essential Question(s):
(MEANT TO BE SHARED WITH STUDENTS)

- How do the decisions humans make have long term environmental impact on future generations?

### Established Goals (Standards, Performance Indicators, Learning Goals):

**Science Standards:**

MS-LS2-5: Evaluate competing design solutions for maintaining biodiversity and ecosystem services. Clarification Statement: Examples of ecosystem services could include … prevention of soil erosion. Examples of design solution constraints could include scientific, economic, and social considerations.

**LS2.C**: Ecosystem Dynamics, Functioning, and Resilience - Biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health.

**LS4.D**: Biodiversity and Humans - Changes in biodiversity can influence humans' resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on--for example, water purification and recycling.

**Social Studies Practices and Standards:**

A. Gathering, Interpreting and Using Evidence

6. Recognize an argument and identify supporting evidence related to a specific social studies topic. Examine arguments related to a specific social studies topic from multiple perspectives; recognize that the perspective of the argument's author shapes the selection of evidence used to support.

B. Chronological Reasoning

1. Identify how events are related chronologically to one another in time and explain the ways in which earlier ideas and events may influence subsequent ideas and events.

**Mathematics Standards:**

CCSS.MATH.CONTENT.7.G.A.1: Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

**ELA Standards:**

CCSS.ELA-LITERACY.W.7.1:Write arguments to support claims with clear reasons and relevant evidence.
CCSS.ELA-LITERACY.W.7.2: Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

**Technology Standards:**

NY State K-12 Computer Science and Digital Fluency Standards
**7-8.DL.2 C**ommunicate and collaborate with others using a variety of digital tools to create and revise a collaborative product.
**7-8.DL.4** Select and use digital tools to create, revise, and publish digital artifacts.
**7-8.DL.5** Transfer knowledge of technology in order to explore new technologies.

International Society of Technology Educators (ISTE) Standards
**1.3 Knowledge Constructor:** Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.

**Social Justice Standards:**

**Domain: Justice**
**Anchor Standard 14**: Students will recognize that power and privilege influence relationships on interpersonal, intergroup and institutional levels and consider how they have been affected by those dynamics.

**Links to Standards/Reference Frameworks:**
**NGSS, NGSS by DCI Nat'l C3 SS Framework, NYS K-8 SS Standards, Common Core, ISTE, Learning for Justice Social Justice Standards, CASEL SEL Framework, NYS CS and Digital Fluency**

## STAGE 2: EVIDENCE & ASSESSMENTS:

**Performance Task Narrative:**

**Goal:**
Erosion leading to mudslides is a problem in our community. The effects of storms and hurricanes have triggered dangerous mudslides that, as recently as 2021, resulted in backyards being swept away in Yonkers. We need to figure out why this is happening and propose solutions. We will use facts and research to establish what has transpired historically and collect and evaluate new information from observations and public data sets. We will study potential solutions and create a proposal to help solve the problem of mudlines in Yonkers.

**Role:**
Researchers, data analysts, urban ecologists, urban planners, documentarians, soil scientists, geologists

**Audience:**
Elected officials, government officials, lobbyists, students, our community, environmental conservation organizations

**Situation:**
As documentarians, students construct a 5-10 min video to show how past decisions have long term environmental impact and offer recommendations for policy makers. Students will be able to build models and code simulations that can be included in their video presentations.

**Product(s):**
- Models of area from the mudslide
- Models of landslides
- Research biodiversity of terrestrial systems in Yonkers and international communities
- Design solutions to prevent further soil erosion
- Digital timelines
- Interview Questions

**Standards (criteria for success):**
- ❑ Students will apply research and teach audience about the history mudslides in Yonkers.

- ❑ Students will research other communities who have solved problems around mudslides.
- ❑ Students will collect data from
- ❑ Students will outline and propose a solution to the problem of mudslides.

**Other Evidence/Assessments:**

## STAGE 3: THE LEARNING PLAN:

### Learning Activities

**Week 1:**

**Learning Goals:** Students will begin by making observations, asking questions, forming hypotheses, and making predictions about mudslides.

**Learning Events:**

1. Anchoring Phenomenon: Mudslides in Yonkers, September 3, 2021
   Video: AERIAL VIDEO: Landslides in Yonkers, N.Y. - YouTube
   Video: Ida Aftermath: Flooding Leads To Mudslides In Yonkers – CBS New York (cbslocal.com)
   After watching the kick off video, students complete a 3-2-1 activity
   - 3 ways that water changes land
   - 2 ways gravity changes land
   - 1 way that those changes could be prevented or minimized

   Video snowboarding/skiing to demonstrate slope
   Students calculate and interpret relationship between slope and speed
2. Paper/3D model: Engineering the steepest slope to race marbles down a ramp
   See for ideas: Mini-Landslide - Activity - TeachEngineering
3. Lab: How does gravity affect materials on a slope?
   SWBAT collect and analyze data to help determine if earth material will move downslope and pose a hazard.
   SWBAT to interview professionals on land management via Zoom.

Teachers can have students work as individual, small group, and whole class. Progressing from individual to small group then whole class instruction ensures that struggling learners have many opportunities to gather knowledge and participate in the culminating discussion.

Students create a static drawing (i.e., initial scientific model) of how gravity and water changes the land.

**Formative Assessments:**

1. SWBAT create a FlipGrid that constructs explanation of their initial paper model
2. SWBAT generate questions and emails to ask professionals (land surveyor, Yonkers Planning Board, community members, etc.) on land management about Yonkers topography. Reference Environmental Assessment form.

**Notes/Resources:**

- Video Link
- Other Resources: digital projector, computer, and speaker
- App Playground Physics

**Week 2**

**Learning Goals:** Students will interpret relationships between slope and speed through an engineering design challenge.

**Learning Events:**
Students are given a design engineering challenge to determine how the slope of land affect the housing infrastructures during a mud slide. Students calculate and interpret relationship between slope and speed.
Constraints: Must include multiple slopes.
Calculations: Speed.

Graph: Angle vs. Speed
Instructional Recommendations:

1. Students will need to conduct research on soil erosion to collect gain a scientific perspective of soil erosion. Additional research can come from class texts and Internet research.
2. Teachers are encouraged complete this activity in advance to know where students will struggle to offer instructional scaffold in the form of small group instruction.

**Formative Assessments:**
Students write scientific arguments supported by claim, evidence, and reason on how to prevent soil erosion.

**Notes/Resources:**
Engineering Materials: Foil tray, paper houses, sand, water, protractor, construction paper/card for ramp, timer, ruler

## Week 3

**Learning Goals:** Students identify what they need to know in order to propose a solution by preparing for an interview with an urban planning expert.

**Learning Events:**
ELA: Students complete research on urban/environmental planning
Constraint: Students use informational text, Urban Planning for Dummies.
Instructional Recommendations:

1. Teacher can generate anticipatory and note-taking graphic organizers as a scaffold for students with IEP or struggling learners.

**Formative Assessments:**
Students generate 10 questions that they would like to ask urban planner from Yonkers regarding the preventing future mudslides in Yonkers.

**Notes/Resources:** Padlet to brainstorm questions

## Week 4

**Learning Goals:** Students practice communication skills as they administer the interview. They determine relationships between colonization and natural resources.

**Learning Events:**
ELA: Students interview land management professional via Zoom
Science: Students select 1 pair of colonized country and colonizer and research supports the claim of the writing prompt.
Constraints: Time-bound between specific periods; specific natural resources (biodiversity) that were exploited by colonizers
Instructional Recommendations:

1. Students gather data in 50 year increments
2. Teacher can generate a note-taking graphic organizer as a scaffold for students with IEP or struggling learners.

Theme: Decisions of colonizers Colonized/Colonizing Pairs: Haiti/France; Mexico/Spain; Puerto Rico/Spain; Dominican Republic/Spain; US/Britain; South African and Britain

Social Studies: Theme: Mercantilism
Video: American Before Columbus Documentary
Writing Prompt: "It is characteristic of capitalism that the development of some countries takes place at the cost of suffering and disaster for the peoples of other countries. For the soaring development of the economy and culture of the so-called “civilized world,” a handful of capitalist powers of Europe and North America, the majority of the world’s population, the peoples of [the Caribbean] Asia, Africa, Latin America, and Australia paid a terrible price."

Healey, Patsy. Political Economy, Diversity and Pragmatism: 2 (Critical Essays in Planning Theory) (p. 40). Taylor and Francis. Kindle Edition.

**Formative Assessments:**
Students create a timeline (using Padlet) of the events of the past shape subsequent events of the

present in both countries. Timelines should include descriptions and pictures. Optional: Student can find topography maps from the timeline and print a 3-D model to use as additional evidence.

**Notes/Resources:** Calendar urban planner interview

**Week 5**

**Learning Goals:** Students will create a video using their research.

**Learning Events:**
Students will begin working on their videos by organizing their research, creating a shot list, begin filming, write the narration for their film, edit, and get feedback then make final edits.

Constraint: Students must integrate qualitative and quantitative evidence collected from each lesson that address soil erosion.

**Formative Assessments:** Video Rubric, Checklist

**Notes and Resources:** Technology: FlipGrid